There can be no reasonable doubt that the general settlement of the western portion of Kansas would have a similar effect upon its rainfall, but it is not reasonable to expect that western Kansas will ever boast of a rainfall equal to that of eastern Kansas. So long as the eastern half of the State remains to the east of the meridian forming the western boundary of the Gulf of Mexico, the south winds will cause it to receive much larger supplies of vapor, for condensation into rain, than will be received by the western half of the State, which lies beyond the immediate track of the vapor-laden winds. It must be remembered that climatic changes are exceedingly gradual, and a rain deficiency or excess for a single year, or for two or three years in succession, must not be considered as invalidating the law of general averages. Neither should the fact that the rainfall upon the whole is increasing, induce settlers to break lands in the western third of Kansas with the expectation of successfully raising the same crops as in eastern Kansas. Such settlers will surely be disappointed. It is even doubtful if paying crops of any kind can ever be continuously produced in that region. With an average before settlement of about 15 inches per annum, the same percentage of increase as has been made in eastern Kansas in thirty years would give less than 18 inches per annum — a quantity entirely inadequate to maintain successful agriculture.

OBSERVATIONS OF NOVEMBER METEORS.

BY R. H. SHORT.

On the 15th of this month, at 2 o'clock P. M., I was examining the sun's disk with a glass giving a power of about 45 or 50 and embracing a field of view of three degrees, to locate the relative position of the sun-spots then visible. After looking at the sun for some five or six minutes, I saw a bright point of light, leaving no train that I could see, cross the middle of the field. The sun was directly in its path; nevertheless it was visible both while entering and leaving the field. The time it occupied in crossing the field was a small fraction of a second.

At the time I did not think much about it; I did not think a meteor could be seen at all near the sun, much less to appear to cross its disk. About five minutes later, another point crossed in almost exactly the same place. The apparent brightness and rate of motion were also the same. I then left the telescope and looked all around the building, to see if there was anything that could produce such an effect by coming between the glass and the sun. I was hardly willing to believe that these two objects were meteors, yet was not able to account for the phenomena in any other way.

Being still undecided, I concluded to watch the sun for a while to see another if I could. I had been looking for at least ten minutes, when a meteor, fire-ball, or something of the kind, crossed the field one-half of a degree from the sun. Its motion was slow, compared with the first, but the direction was the same in all three cases, namely, from southeast to northwest. This last was more distinct than the others, perhaps because of its distance from the sun's disk. Its apparent diameter was about that of Venus. It crossed the field (three deg.) in not less than one-fifth of a second. Its brightness was about one-half that of the sun, and color a shade of yellow. It left a train visible after the meteor had left the field. A few minutes after, clouds obscured the sun and also the western sky. It remained cloudy until about 5 o'clock. From 5 o'clock until sunset, nothing comparable to meteors was seen.

Between 8 and 9 o'clock P. M. of the same day, I saw three bright meteors follow, as nearly as I could judge, the same course as those that were seen in daylight. The radiating point of these last three was from a point in the southern part of Andromeda.

The following notices of extraordinary meteors are from "Kirkwood's Meteoric Astronomy":

On the 15th of November, 1859, between 9 and 10 o'clock in the morning, an extraordinary meteor was seen in several of the New England States, New York, New Jersey, District of Columbia, and Virginia. The apparent diameter of the head was nearly equal to that of the sun, and it had a train, notwithstanding the bright sunshine, several degrees in length. Its disappearance on the coast of the Atlantic was followed by a series of the most terrific explosions. It is believed to have descended into the water—probably into Delaware Bay. A highly interesting account of this meteor, by Prof. Loomis, may be found in the American Journal of Science and Arts, for January, 1860.

On February 6th, 1818, one was seen in England at 2 P. M., shining with a light equal to that of the sun.

On November 12th, 1828, a meteor was seen in the sunshine at Surg, France.

Humboldt, after describing the great shower of 1799, witnessed by himself and Bonpland, states that "the phenomenon ceased by degrees after 4 o'clock and the bolides and falling stars became less frequent, but we still distinguished some toward the northeast a quarter of an hour after sunrise."

June 17th, 1779, about midday, the eminent French astronomer Messier saw a great number of black points crossing the sun. Rapidly-moving spots were also seen by Pastorff on the following dates: October 23d, 1822; July 24th and 25th, 1823; October 18th, 1836; and on several subsequent occasions the same astronomer witnessed similar phenomena.

Another transit of this kind has been seen quite recently. On the 8th of May, 1865, a small black spot was seen by Coumbary to cross the solar disk.

Thus we have well-authenticated records of meteors having been seen as bright bodies in bright sunlight, and that they have been seen far beyond our atmosphere as black spots on the sun's disk.

The November meteors proper from Leo were not very numerous this year. On November 13 no meteors from Leo were seen. Mr. W. S. Franklin watched during the latter part of the night of the 13th, and I the first part. On the 14th, 15th and 16th the weather was very pleasant, so Mr. Franklin and myself watched for Leonides from 12 o'clock, midnight, until morning, Mr. Franklin watching one part of the sky, and I the other. We recorded at least thirty that could be traced to Leo.

ON THE PHOSPHORESCENCE OF CHLOROPHANE FROM PIKE'S PEAK.

BY PROF. G. H. FAILYER, STATE AGRICULTURAL COLLEGE.

During the summer of 1881, the writer collected fluorite of various colors—white, green, rose and purple—in the Pike's Peak region.

Having recently had occasion to examine its property of phosphorescence, he found that it exhibited phenomena so unlike what he had anticipated from his knowledge of the phosphorescence of fluorite, that he made a somewhat minute examination of the specimens. It was first observed that when fragments of the fluorite—these fragments being indifferently fine powder or thin pieces an inch across—were dropped upon a metallic plate heated to a temperature considerably below redness, a green light was soon emitted. The green light deepened in tint as the temperature increased, and gradually gave place to light of a violet color. This, in turn, became of deeper hue, and at last faded. It is well known that fluorite phosphoresces when heated, that some specimens give white light, some green, others violet or purple; and that when brought to a sufficiently high temperature they all lose the power to phosphoresce. But this change of color as the temperature is raised was entirely unexpected, and I have searched the books in vain to find mention of it. The September, 1884, *Am. Jour. of Science*, contains